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Southern Pine BEETLE NEWS

No. 21, June 1980

SPB Parasites Peak During Summer

Investigators from the Louisiana Agricultural Experiment Station have discovered that even the pesky southern pine beetle is plagued by parasites. Six parasitic wasps were most abundant from April through June and were generally low from December through March. These patterns closely followed seasonal periods of SPB activity.

The torymid wasp, *Roptrocus eccoptogastri* (= *xylophagorum*), was the most common parasite, representing 65 percent of the parasites caught. It entered the beetle's egg galleries and laid its eggs in SPB egg niches, while the other parasites laid their eggs through the bark. Parasites laying their eggs through the bark concentrated on thinner-barked portions of beetle-infested trees.

A strong relationship existed between numbers of southern pine beetles and *R. eccoptogastri*. Populations of the other species did not correlate with the number of southern pine beetles.

GOYER, R. A., and C. K. FINGER.

1980. Relative abundance and seasonal distribution of the major hymenopterous parasites of the southern pine beetle, *Dendroctonus frontalis* Zimmermann, on loblolly pine. *Environ. Entomol.* 9:97-100.

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For More Information . . .

For the purpose of better communication, southern pine beetle research has been divided into eight study areas. Each division has its own technology transfer team that may be contacted for further information on SPB control.

Silvicultural Practices and Stand Rating Systems

R. P. Belanger, Team Leader, Southeast. For. Exp. Stn., Carlton St., Athens, GA 30601. Teleph. 404-546-2467; FTS 250-2422.

H. L. Williston, State and Priv. For., Jackson, MS

T. Price, Ga. For. Comm., Macon, GA

B. Malac, Union Camp Corp., Rincon, GA

J. R. McGraw, Coop. Ext. Serv., N. C. State Univ., Raleigh, NC

K. M. Swain, State and Priv. For., Atlanta, GA

J. E. Coster, SPB Program, Pineville, LA

Guidelines for Utilizing SPB-Killed Timber

R. F. Westbrook, Team Leader, State and Priv. For., 2500 Shreveport Hwy., Pineville, LA 71360. Teleph. 318-473-7282; FTS 497-7282.

D. Weldon, Tex. For. Serv., Lufkin, TX

G. Ifju, Va. Polytech. and State Univ., Blacksburg, VA

J. L. Barrett, Natl. For., R-8, Atlanta, GA

M. P. Levi, Coop. Ext. Serv., N. C. State Univ., Raleigh, NC

B. Deless, Ga. Pac. Corp., Crossett, AR

G. D. Hertel, SPB Program, Pineville, LA

Socioeconomic Guidelines

J. Lewis, Team Leader, State and Priv. For., 1720 Peachtree Road, NW, Atlanta, GA 30309. Teleph. 404-881-7934; FTS 257-7934.

SJ-0710

G. Dutrow, Southeast. For. Exp. Stn., Durham, NC

M. Vasievich, Southeast. For. Exp. Stn., Durham, NC

Sue Harper, State and Priv. For., Atlanta, GA

W. A. Leuschner, Va. Polytech. and State Univ., Blacksburg, VA

B. Schick, Westvaco Corp., Rupert, WV

R. C. Thatcher, SPB Program, Pineville, LA

New Insecticides and Improved Spray Systems

J. W. Taylor, Team Leader, State and Priv. For., 1720 Peachtree Road, NW, Atlanta, GA 30309. Teleph. 404-881-7934; FTS 257-7934.

C. W. Berisford, Univ. of Ga., Athens, GA

F. L. Hastings, Southeast. For. Exp. Stn., Res. Triangle Park, NC

C. Fleming, Natl. Park Serv., Beaumont, TX

A. D. Dressen, Coop. Ext. Serv., Houston, TX

J. Godbee, Union Camp. Corp., Rincon, GA

J. E. Coster, SPB Program, Pineville, LA

Sampling Methods and Predictive Models

F. M. Stephen, Team Leader, Dep. Entomol., Univ. of Ark., Fayetteville, AR 72701. Teleph. 501-443-5287; FTS 740-5011.

R. N. Coulson, Tex. A. & M. Univ., College Station, TX

R. M. Feldman, Tex. A. & M. Univ., College Station, TX

W. A. Carothers, State and Priv. For., Doraville, GA

B. Hynum, Tex. For. Serv., Lufkin, TX

G. D. Hertel, SPB Program, Pineville, LA

Aerial Survey and Navigation Systems

J. G. D. Ward, Team Leader, State and Priv. For., 3620 I-85, NE, Doraville, GA 30340. Teleph. 404-221-4796; FTS 242-4796.

C. Dull, State and Priv. For., Doraville, GA

M. Remion, S. C. For. Comm., Columbia, SC

W. H. Klein, State and Priv. For., Davis, CA

J. Pase, Tex. For. Serv., Lufkin, TX

W. H. Clerke, State and Priv. For., Atlanta, GA

G. D. Hertle, SPB Program, Pineville, LA

Behavioral Chemicals

T. L. Payne, Team Leader, Dep. Entomol., Tex. A. & M. Univ., College Station, TX 77843. Teleph. 713-845-3825; FTS 527-1378.

W. Hoffard, State and Priv. For., Asheville, NC

R. L. Hedden, Clemson Univ., Clemson, SC

R. F. Billings, Tex. For. Serv., Lufkin, TX

J. W. Peacock, Northeast. For. Exp. Stn., Delaware, OH

J. E. Coster, SPB Program, Pineville, LA
Integrated Management Strategies

R. N. Coulson, Team Leader, Dep. Entomol., Tex. A. & M. Univ., College Station, TX 77843. Teleph. 713-845-6541; FTS 522-2516.

Team Leaders

SPB Program Management

High Temperatures Speed SPB Predator's Growth

High temperatures quicken development of an SPB predator, the clerid beetle *Thanasimus dubius*.

To arrive at this conclusion, scientists collected adult clerid beetles in southwestern and northeastern Mississippi. Adult beetles were paired, and for 24 hours their eggs were reared in three temperatures—15°C (59°F), 21°C (70°F), and 27°C (81°F). Eggs hatched within 6 to 7 days at 27°C, while 18 to 19 days were required for hatching in 15°C temperatures. Larval development from eggs in 15°C temperatures was about 87 days but was only 35 days at 27°C.

To test how prey type affects clerid beetles, scientists fed them small SPB larvae, large larvae, and pupae. Scientists then studied stages of clerid beetle development by observing the molting process daily. The clerid beetle's overall development from egg to adult was not affected by SPB prey type. However, SPB prey type did have an affect when the predator's life stages were analyzed separately. Prepupal and pupal development of clerid beetles was about 8.7 days shorter when they were fed small SPB larvae than when they were fed large prey. But when clerid beetle larvae were fed small SPB larvae, the clerid beetles took 3.9 days longer to develop.

Scientists used wing cover length to compare clerid beetle sizes. The wing covers of clerid beetles were shorter if the clerid beetles were exposed to high temperatures or if the clerid beetles were fed small SPB prey. Scientists explain that wing length may have been influenced by the nutrient content of SPB prey, the amount of food consumed, or other unknown factors. NEBEKER, T. E., and G. C. PURSER.

1980. Relationship of temperature and prey type to developmental time of the bark

beetle predator *Thanasimus dubius* (Coleoptera: Cleridae). Can. Entomol. 112:179-184.

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Extra! Extra!

As a bonus, studies unrelated to southern pine beetle research are making discoveries about the SPB. In a study on thinning of second-growth, even-aged loblolly-shortleaf pine stands, Jim Burton discovered that lightly thinned sites were more severely damaged by beetles than heavily thinned sites. The beetle-caused mortality was not related to site quality. (Burton, J. D. 1979. Growth and yield in managed natural stands of loblolly and shortleaf pine in the West Gulf Coastal Plain. U.S. Dep. Agric. For. Serv. Res. Pap. SO-159, 61 p. South. For. Exp. Stn., New Orleans, La.)

SPB Populations Are Similar In Loblolly, Shortleaf Pines

The southern pine beetle is not a finicky pest. When given the choice of loblolly or shortleaf pines, the beetle is equally interested in attacking either host. Researchers also discovered that declining populations of beetles in North Carolina were similar to expanding populations of beetles in east Texas.

To conduct the North Carolina study, 30 infested loblolly and shortleaf pines were sampled in 11 infestations in 3 counties from 1975 to 1977. Within-tree estimates of SPB life stages were calculated with a topological mapping procedure and a proportional density function procedure. Findings indicated that the same sampling and analytical procedures could be used for estimating southern pine beetle populations in loblolly and shortleaf pines in Texas and North Carolina.

Researchers also found that a less intensive procedure can correctly estimate SPB

populations. A less precise analytical measure was used, and bark disks were removed from only 3 sample levels for each infested tree instead of from 10 sample levels. This approach provided more accurate estimates than did an intensive procedure for all SPB life stages infesting loblolly pine and for SPB parent adults attacking shortleaf pine.

MCCLELLAND, W. T., F. P. HAIN, and W. D. MAWBY.

1979. Comparison of within-tree distributions and population estimation procedures for declining populations of *Dendroctonus frontalis* colonizing loblolly and shortleaf pine. Environ. Entomol. 8:1037-1040.

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NC = TX In SPB Sampling

North Carolina equals Texas—at least when it comes to methods for estimating southern pine beetle numbers.

Scientists reported that they were able to count declining beetle populations in North Carolina with the same techniques used for counting beetle epidemics in Texas. Despite the difference in beetle populations, scientists discovered that the within-tree distribution of all SPB life stages was similar in both states.

Using topological mapping procedures, scientists estimated insect densities in North Carolina. Measurements needed for this procedure included tree height, infested bole height, diameter at breast height, and diameter and bark thickness at bark sampling intervals of 1.5 m along the infested tree bole.

When estimating insect densities a second time, scientists used the less precise tree geometry method that had been developed in Texas. The only measurements required in this procedure were tree diameter and bark thickness at 2 m and infested bole height.

Results of both procedures were the same in North Carolina as in Texas, even though the tree geometry method was developed for a different region and for different population levels. And, since the simpler tree geometry method is still accurate, scientists believe two or three bark

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PROCUREMENT SECTION
CURRENT SERIAL RECORDS

sample levels per tree will be adequate for estimating within-tree SPB life stages.

HAIN, F. P., W. T. MCCLELLAND, D. N. POPE, P. E. PULLEY, J. L. FOLTZ, and R. N. COULSON.

1978. Standardized within-tree sampling for populations of *Dendroctonus frontalis*. Environ. Entomol. 7(1):157-164.

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Loblolly Pine Plantation Model Welcomed by Forestry Community

Since March, the loblolly pine plantation growth model (PTAEDA) developed by Richard Daniels and Harold Burkhart has been widely used by resource managers and researchers. The program's source decks and listings have been mailed to three U.S. Forest Service units, six industrial firms and seven universities. About 800 copies of the publication describing the model have been distributed (Daniels, R. F. and H. E. Burkhart. 1975. Simulation of individual tree growth and stand development in managed loblolly pine plantations. Va. Polytech. & State Univ., Sch. For. & Wildl. Res. Publ. FWS-5-75, Va. Polytech. & State Univ., Blacksburg.). For an individual copy, write Richard Daniels at the Department of Forestry, Virginia Polytechnic Institute and State University, Blacksburg, Va., 24061.

SPB Grant Recipient Honored By University of Georgia

Dr. C. Wayne Berisford, a southern pine beetle investigator, has been honored as one of the top grant recipients in the research faculty of the Georgia Agriculture Experiment Station in Athens.

Berisford, an associate professor of entomology at the University of Georgia, has been principal investigator in two southern pine beetle projects. One project determined regional and seasonal variations in SPB pheromones. Another project is determining the role of three parasites in regulating SPB populations.

Berisford codirected five other southern pine beetle projects with Dr. U. Eugene Brady, professor of entomology at the University of Georgia. Two projects compared the effectiveness of concentrations of chlorpyrifos and chlorpyrifos-methyl with a concentration of lindane in preventing tree deaths from southern pine beetles. A third project evaluated fenitrothion as an insecticide for SPB control and compared the hanging bolt and standing tree techniques for testing insecticides. In another study, Berisford and Brady evaluated the low drift spray systems that are used commercially for treating standing trees. A fifth project determined if SPB attacks could be prevented by applying insecticide to only the lower two-thirds of the tree bole.

All publications are partially or wholly supported by the Southern Pine Beetle Program.